



The US/Global Achilles Heel: Economic Terrorism

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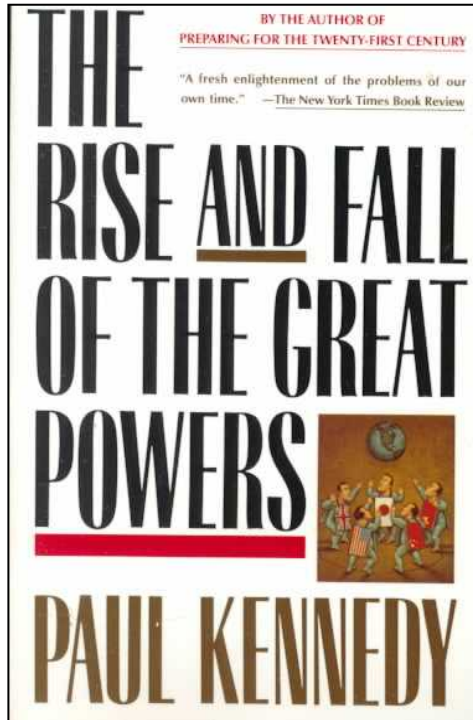
A Plan of Attack



“So we are continuing this policy in bleeding America to the point of bankruptcy.... every dollar of al-Qaida defeated a million dollars by the permission of Allah, besides the loss of a huge number of jobs... which is evidence of the success of the bleed-until-bankruptcy plan - with Allah's permission.”

English transcript of Usama bin Ladin's speech as published by Aljazeera, Monday, 01 November 2004

Tough Lessons of History



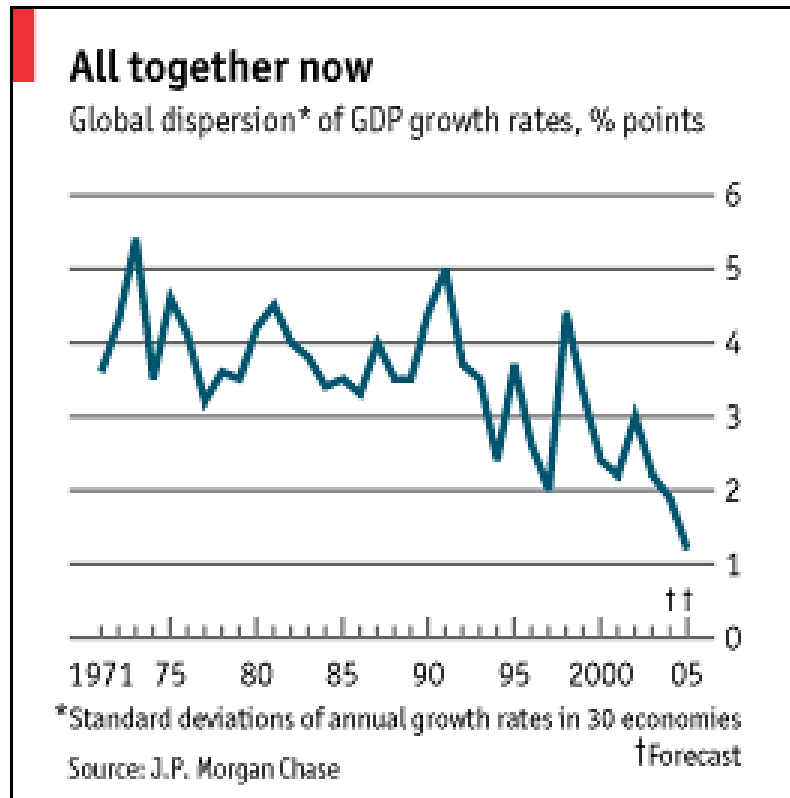
“.. if a state overextends itself strategically--by, say, ... the waging of costly wars--it runs the risk that the potential benefits from external expansion may be outweighed by the great expense of it all -- a dilemma which becomes acute if the nation concerned has entered a period of relative economic decline.”

Paul Kennedy, *The Rise and Fall of the Great Powers*

“In The Rise and Fall of Great Nations, Paul Kennedy asserts that economic power is inseparable from political and military power in the natural development of a nation. In the United States, we may hang onto military strength for many years, but our ultimate strength will come from the strength of our economy and what we can sustain for a long period.”

Commander Daniel E. Busch, *Strategic Implications of the North American Free Trade Agreement*, U.S. Navy, National Defense University, 1993

A US Weak-Link Breaks the Chain



From: The Economist print edition
Economic growth: Dancing in Step
11 November 2004

“Indeed, growth rates around the world are currently more synchronized than ever, according to the J.P. Morgan global growth dispersion index (see chart)... Over the past few years the degree of growth dispersion has fallen to half that in the 1970s. Based on the bank's forecasts for 2005, growth will become even more synchronized...”

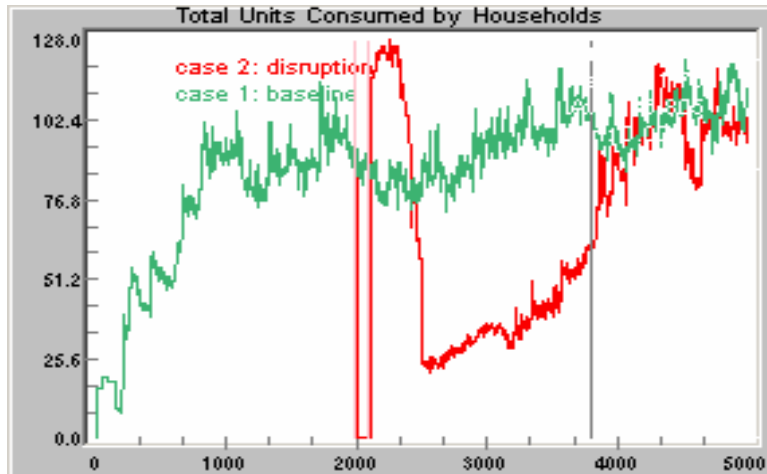
Two forces lie behind all this. First, in recent years many economies have been driven by common factors... Second, countries' business cycles are also becoming more closely correlated, as greater integration through trade, investment and financial markets causes economies to move more closely in step.”



Modeling Impacts to Confidence & Economy

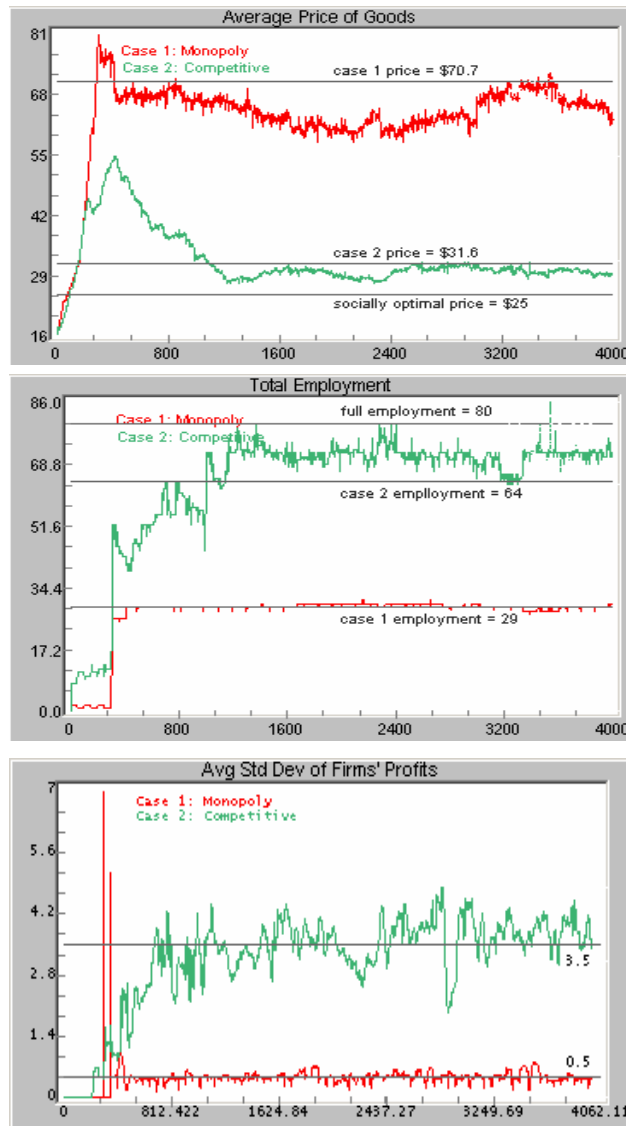
- Model dynamic impacts of terrorist events on Confidence & the Economy
- Identified/incorporated critical model components
 - developed broad framework of households, firms, stock & bonds markets
 - developed baselines and validation in labor and goods markets
 - initiated behavior and choice as agents differentiate & weigh options (WIP)
 - initiated price formation in financial markets (WIP)

SAND04-5972: Market Disruption, Cascading Effects, and Economic Recovery



Post-event (of an illustrative scenario), there is an unsustained recovery followed by a prolonged slump as the loss of consumption drives business and employment in a downward spiral. The response to lost-income takes many years to recover.

SAND04-5500: Full Employment and Competition in the Aspen Economic Model: Implications for Modeling Acts of Terrorism



Baselines for V&V and hypothesis exploration

- derived & demonstrated convergence to equilibriums and compatibility to economic theory for price/wage, employment, and consumption, in both competitive & monopoly cases
- identified emergent behavior, responses to partial information, and changes in variance



SAND04-6xxx: On the Use of Models to Explore Economic Confidence

- Empirical studies indicate that consumption is more sensitive to current income than suggested under the conventional permanent income hypothesis
 - explored questions regarding expectations for future income, risk aversion, and the role of economic confidence measures.
 - surveyed body of fundamental economic literature and computational economic modeling methods to better understand cascading economic responses from terrorist threats and attacks.
- Three part survey to support incorporating economic models of confidence into agent-based microeconomic simulations.
 - reviewed underlying economic principles related to confidence dynamics.
 - reviewed the empirical studies related to economic confidence.
 - provided a brief survey of efforts and publications related to agent-based economic simulation.



SAND04-4218: Approach and Development Strategy for an Agent-based Model of Economic Confidence

- Extended features of Aspen, a powerful economic modeling tool, to simulate the role of confidence in economic activity.
 - represents households, firms, and other relevant entities like financial exchanges and governmental authorities as a collection of autonomous agents.
 - simultaneously models several interrelated markets and their price-formation, including those for labor, products, stocks, and bonds.
 - captures economic tradeoffs, such as decisions of households and firms regarding spending, savings, and investment.
 - paper reviews basic principles and model components and describes the approach and development strategy for emulating consumer, investor, and business confidence



Avoiding the Curse of History

- While loss of life is the operating concern of DHS, the security of the economy ultimately decides the success of the war on terrorism.
- The uniqueness of agent-based modeling lies in its ability to comprehensively detect potential threats, portray unfolding dynamics, and determine both pre- and post-attack mitigation options.
 - when calibrated to actual conditions, the SNL framework could address the possibly high consequence on the US economy of financially-disruptive terrorist events outside the US.
 - more importantly, the use of the SNL approach, in the context of the broader US economy, would provide a tactical capability to manage the response and recovery of critical economic sectors.
- The analysis of extreme economic conditions using agent-based models is a necessary component to winning the war on terrorism.